

CLAIMS

1 1. A circuit testing apparatus comprising:

2 a controller for controlling signals being transferred between a circuit under

3 test and the circuit testing apparatus; and

4 a driver circuit for generating signals to be applied to the circuit under test,

5 the driver circuit includes a high speed slave chain and a DC control loop chain

6 coupled to the circuit under test, the high speed slave chain receives a differential

7 voltage logic pulse train and converts said logic pulse train into an high speed

8 current steering for producing said drive signal to be applied to the circuit under

9 test, the DC control loop chain provides feedback paths for DC regulation of inputs

10 of said high speed slave chain.

1 2. The circuit testing apparatus of claim 1, wherein the driver is a class A driver.

1 3. The circuit testing apparatus of claim 1, wherein the driver circuit is coupled to a

2 pin on the circuit under test.

1 4. The circuit testing apparatus of claim 1, further comprising a receiver circuit for

2 receiving output signals from the circuit under test.

1 5. The circuit testing apparatus of claim 4, wherein the receiver circuit is coupled to a

2 pin on the circuit under test.

1 6. The circuit testing apparatus of claim 4, wherein the receiver circuit and the driver

2 circuit are coupled together to a pin on the circuit under test.

- 1 7. The circuit testing apparatus of claim 1, wherein the high speed slave chain further
- 2 includes an input clamp stage for receiving said differential logic pulse train and
- 3 converting said differential logic pulse train into fixed amplitude complimentary
- 4 output voltages.
- 1 8. The circuit testing apparatus of claim 1, wherein the DC control loop chain further
- 2 includes an input clamp stage for receiving fixed differential logic signals and
- 3 converting said fixed differential logic pulse train into fixed amplitude
- 4 complimentary output voltages.
- 1 9. The circuit testing apparatus of claim 8, wherein the high speed slave chain and DC
- 2 control loop chain further include a current controlled gain stage for receiving fixed
- 3 amplitude complimentary output voltages of the input clamp stage and employing a
- 4 controlled cascode translinear multiplier cell configuration to provide a wide
- 5 bandwidth with high DC precision and low distortion means of controlling the
- 6 amplitude.
- 1 10. The circuit testing apparatus of claim 9, wherein the high speed slave chain and DC
- 2 control loop further includes an output stage that is a standard cascaded differential
- 3 linear amplifier.
- 1 11. The circuit testing apparatus of claim 10, wherein the output stage of the high speed
- 2 slave chain whose output currents drive an output resistor of the said driver.

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- 1 12. The circuit testing apparatus of claim 10, wherein the output stage of DC control
- 2 loop chain provides feedback currents to DC control loop chain
- 1 13. The circuit testing apparatus of claim 1, wherein the high speed slave chain and DC
- 2 control loop chain further comprises an output stage that includes a differential-
- 3 input pair of transistors which receive a differential voltage input signal to drive the
- 4 their respective output stage circuits.
- 1 14. The circuit testing apparatus of claim 13, wherein the output stage further includes
- 2 a pair of transistors that receive a single-ended voltage input.
- 1 15. The circuit testing apparatus of claim 14, the output stage further includes a
- 2 resistance coupled between the transistors, the differential voltage input signal
- 3 controlling an amount of current through the resistance to control a current level in
- 4 each of the transistors to generate the drive signal applied to the circuit under test.
- 1 16. The circuit testing apparatus of claim 14, the output stage further includes a pair of
- 2 current sources coupled to the transistors, each of the current sources driving a
- 3 respective current through a respective one of the pair of transistors.
- 1 17. The circuit testing apparatus of claim 16, the output stage further includes a
- 2 resistance coupled between the transistors, the differential voltage input signal
- 3 controlling an amount of current through the resistance to control a current level in
- 4 each of the transistors to generate the drive signal applied to the circuit under test.

1 18. The circuit testing apparatus of claim 9, wherein the transistors are bipolar junction
2 transistors.

1 19. A circuit testing apparatus comprising:

controlling means for controlling signals being transferred between a circuit

3 under test and the circuit testing apparatus; and

driving means for generating signals to be applied to the circuit under test,

the driver circuit includes a high speed slave chain and a DC control loop chain.

coupled to the circuit under test, the high speed chain circuit receives a differential

voltage logic pulse train and converts said logic pulse train into an high speed

5 current steering for producing said drive signal to be applied to the circuit und

test, the DC control loop chain provides feedback paths for DC regulation of input

7 of said high speed slave chain.

1 20. The circuit testing apparatus of claim 19, wherein the driver is a class A driver.

1 21. The circuit testing apparatus of claim 19, wherein the driver circuit is coupled to a

2 pin on the circuit under test.

1 22. The circuit testing apparatus of claim 19, further comprising a receiver circuit for

2 receiving output signals from the circuit under test.

1 23. The circuit testing apparatus of claim 22, wherein the receiver circuit is coupled to

2 a pin on the circuit under test.

- 1 29. The circuit testing apparatus of claim 28, wherein the output stage of the high speed
- 2 slave chain whose output currents drive an output resistor of the said driver.
- 1 30. The circuit testing apparatus of claim 29, wherein the output stage of DC control
- 2 loop chain provides feedback currents to DC control loop chain
- 1 31. The circuit testing apparatus of claim 19, wherein the high speed slave chain and
- 2 DC control loop chain further comprise an output stage that includes a differential-
- 3 input pair of transistors which receive a differential voltage input signal to drive the
- 4 their respective output stage circuits.
- 1 32. The circuit testing apparatus of claim 31, wherein the output stage further includes
- 2 a pair of transistors that receive a single-ended voltage input.
- 1 33. The circuit testing apparatus of claim 32, the output stage further includes a
- 2 resistance coupled between the transistors, the differential voltage input signal
- 3 controlling an amount of current through the resistance to control a current level in
- 4 each of the transistors to generate the drive signal applied to the circuit under test.
- 1 34. The circuit testing apparatus of claim 33, the output stage further includes a pair of
- 2 current sources coupled to the transistors, each of the current sources driving a
- 3 respective current through a respective one of the pair of transistors.
- 1 35. The circuit testing apparatus of claim 34, the output stage further includes a
- 2 resistance coupled between the transistors, the differential voltage input signal

3 controlling an amount of current through the resistance to control a current level in
4 each of the transistors to generate the drive signal applied to the circuit under test.

1 36. The circuit testing apparatus of claim 31, wherein the transistors are bipolar
2 junction transistors.

1 37. A method of testing a circuit, comprising:

2 providing a controller for controlling signals being transferred to and from
3 the circuit under test;

4 providing a driver circuit coupled to the circuit under test;

5 receiving a differential voltage logic pulse train; and

6 converting said logic pulse train into a high speed current steering for
7 producing said drive signal to be applied to the circuit under test.

1 38. The circuit testing apparatus of claim 37, wherein the driver circuit is a class A
2 driver.

1 39. The circuit testing apparatus of claim 37, wherein the driver circuit is coupled to a
2 pin on the circuit under test.

1 40. The circuit testing apparatus of claim 37, further providing a receiver circuit for
2 receiving output signals from the circuit under test.

1 41. The circuit testing apparatus of claim 40, wherein the receiver circuit is coupled to
2 a pin on the circuit under test.

- 1 42. The circuit testing apparatus of claim 41, wherein the receiver circuit and the driver
- 2 circuit are coupled together to a pin on the circuit under test.
- 1 43. The circuit testing apparatus of claim 38, wherein receiving said differential logic
- 2 pulse train further includes converting said differential logic pulse train into fixed
- 3 amplitude complimentary output voltages.
- 1 44. The circuit testing apparatus of claim 38, further comprising receiving fixed
- 2 differential logic signals and converting said fixed differential logic pulse train into
- 3 fixed amplitude complimentary output voltages.
- 1 45. The circuit testing apparatus of claim 44, further comprising receiving fixed
- 2 amplitude complimentary output voltages and employing a controlled cascode
- 3 translinear multiplier cell configuration to provide a wide bandwidth with high DC
- 4 precision and low distortion means of controlling the amplitude.
- 1 46. The circuit testing apparatus of claim 44, wherein the driver circuit further includes
- 2 a standard cascoded differential linear amplifier.